

**COPPER INTERCONNECT SYSTEMS WHICH USE CONDUCTIVE,
METAL-BASED CAP LAYERS**

Abstract of the Disclosure

An integrated circuit (IC) may include a substrate, a first dielectric layer adjacent the substrate, and at least one trench in the first dielectric layer. The IC may also include a metal liner within the at least one trench, and a first conductive region including copper within the at least one trench. A cap layer including metal may be provided on the first conductive region. A second dielectric layer may be over the first conductive region and the cap layer. A dielectric etch stop and diffusion barrier layer may be over the second dielectric layer, and a via may be over the first conductive region and through the second dielectric layer and the cap layer. A diffusion barrier layer may be on sidewalls of the via, and an alloy seed layer including copper and at least one of tantalum, molybdenum, chromium, and tungsten may be over the diffusion barrier. The alloy seed layer may also be over the dielectric etch stop and diffusion barrier layer, and the alloy seed layer may be in contact with the first conductive region.